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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/494,211	01/25/2000	Il-Ki Woo	003364.P035	3154

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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/494,211	WOO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Tracy Dove	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 2/2/04. Applicant's arguments have been considered, but are moot in view of the new grounds of rejection. Claims 1-32 are pending. This Action is made **FINAL**, as necessitated by amendment.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 3 have been amended to recite a Cu-alloy comprising at least boron or cobalt and further comprising at least one of nickel, titanium, magnesium, tin, zinc, chromium, manganese, iron, vanadium, aluminum, zirconium, niobium, bismuth, lead, silver or misch metal. Claims 4 and 19 have been amended to recite a Cu-alloy comprising at least boron or cobalt and further comprising at least two of nickel, titanium, magnesium, tin, zinc, chromium, manganese, silicon, iron, vanadium, aluminum, zirconium, niobium, phosphorous, bismuth, lead, silver or misch metal. Claim 26 has been amended to recite a Cu-alloy comprising at least boron or cobalt and further comprising at least two of nickel, titanium, magnesium, manganese or zinc. However, the specification does not provide support for the specific copper alloy compositions claimed in claims 1, 3, 4, 19 and 26. Specifically, the specification does not disclose a copper

Art Unit: 1745

alloy containing boron or cobalt and at least one other metal. There is no specific disclose in the specification of a copper alloy containing boron or cobalt and at least one other metal.

Furthermore, the specification does not even teach boron or cobalt are preferred for the copper based alloy. Thus, it does not appear that applicant had possession of the claimed invention.

Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a Cu-based alloy comprising at least one material selected from the group consisting of nickel, titanium, magnesium, tin, zinc, chromium, manganese, iron, vanadium, aluminum, zirconium, niobium, bismuth, lead, silver, cobalt, boron or misch metal., does not reasonably provide enablement for a Cu-based alloy comprising at least boron or cobalt and further comprising at least one of nickel, titanium, magnesium, tin, zinc, chromium, manganese, iron, vanadium, aluminum, zirconium, niobium, bismuth, lead, silver or misch metal. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 15-18 are indefinite because each claim recites "the Cu-based alloy consists essentially of", but does not recite boron or cobalt as a component of the Cu-based alloy. Claim 4 requires that boron or cobalt be present in the Cu-based alloy.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 32 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi et al., WO 97/32347.

Ohashi teaches a lithium battery comprising a cathode, an anode, a separator between the cathode and the anode and an electrolyte (page 6, lines 8-14). The cathode includes a paste containing  $\text{LiCoO}_2$  coated on a foil current collector. The negative electrode includes a carbonaceous material coated on a current collector. The collector for both electrodes (anode and cathode) may be a metal foil and is preferably made of a metal which does not easily produce an alloy with lithium such as iron, nickel, cobalt, copper, titanium, vanadium, chromium, manganese or one of their alloys (page 2, lines 26-33; Example 1). Example 1 teaches a copper foil current collector for the anode having a thickness of 20  $\mu\text{m}$ .

Thus the claim is anticipated.

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Claim 32 is rejected under 35 U.S.C. 102(a) as being anticipated by Takagi et al., JP 11-086871.

Takagi teaches a copper foil current collector for a lithium secondary battery. The battery comprises a negative electrode including an active material paste coated on the current

Art Unit: 1745

collector. The active material may be carbon or graphite (abstract). The current collector is preferably 10-20  $\mu\text{m}$  in thickness (0010) and is formed of a copper alloy foil containing copper and 0.02 wt% or less of at least one of P, Pb, Fe, Sn, Zn, Ni, As, Bi, Ag, S, Cd, Hg, Se, Te, Zr, In, Ga, Ti, Co, Sb or Au based on the weight of the alloy (0005-0008).

Thus the claim is anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 26, 27, 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai et al., US 5,368,958.

Hirai teaches a rechargeable lithium battery comprising an anode, a cathode, a separator and an electrolyte (4:45-50). The cathode active material may be a lithium transition metal oxide compound (4:61-5:2). The anode active material may be lithium, lithium alloys or lithium intercalation compounds such as various kinds of carbon materials (4:31-36). The anode further contains a metal, alloy or composite foil comprising an alloy having at least two materials selected from the group consisting of Cr, Cu, Au, Ag, Al, In, Fe, Pb, Mn, Zn, Cd, Tl, Co, Ni and Sn. The foil has a thickness of from 5-500  $\mu\text{m}$  (4:8-17). Example 1 teaches a copper foil with a thickness of 9  $\mu\text{m}$  as the anode current collector.

Art Unit: 1745

Hirai does not explicitly teach a copper alloy comprising at least boron or cobalt wherein the alloy further comprises at least one of Ni, Ti, Mg, Sn, Zn, Cr, Mn, Fe, V, Al, Zr, Nb, Bi, Pb, Ag or misch metal.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Hirai teaches a copper alloy foil may be used as the anode current collector. Hirai teaches that copper may be alloyed with materials such as Co, Ni, Sn, Zn, Cr, Mn, Fe, Al, Pb or Ag. Thus, Hirai suggests a copper alloy foil wherein the copper alloy comprises Co and at least one additional material such as Ni, Sn, Zn, Cr, Mn, Fe, Al, Pb or Ag. Hirai does not disclose any specific alloy compositions. However without any showing of critically, the claimed Cu-based alloy foil is considered obvious in view of Hirai

The courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious (In re Fessman). Thus, the limitation “produced by a plating process” is considered obvious in view of the prior art.

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Claims 1-6, 19-21, 26, 27 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al., JP 11-086871.

Takagi teaches a copper foil current collector for a lithium secondary battery. The battery comprises a negative electrode including an active material paste coated on the current collector. The active material may be carbon or graphite (abstract). The current collector is preferably 10-20  $\mu\text{m}$  in thickness (0010) and is formed of a copper alloy foil containing copper and 0.02 wt% or less of at least one of P, Pb, Fe, Sn, Zn, Ni, As, Bi, Ag, S, Cd, Hg, Se, Te, Zr,

Art Unit: 1745

In, Ga, Ti, Co, Sb or Au based on the weight of the alloy (0005-0008). The copper alloy foil may be formed by an electrolytic decomposition process (0009).

Takagi does not explicitly teach a copper alloy comprising at least boron or cobalt wherein the alloy further comprises at least one of Ni, Ti, Mg, Sn, Zn, Cr, Mn, Fe, V, Al, Zr, Nb, Bi, Pb, Ag or misch metal.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Takagi teaches a copper alloy foil containing copper and 0.02 wt% or less of at least one of P, Pb, Fe, Sn, Zn, Ni, As, Bi, Ag, S, Cd, Hg, Se, Te, Zr, In, Ga, Ti, Co, Sb or Au may be used as the anode current collector. Thus, Takagi suggests a copper alloy foil wherein the copper alloy comprises Co and at least one additional material such as Ni, Ti, Fe, Sn, Zn, Zr, Bi, Pb or Ag. Takagi does not disclose any specific alloy compositions. However without any showing of critically, the claimed Cu-based alloy foil is considered obvious in view of Takagi.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

Note that if the claims are amended to remove the new matter and overcome the scope of enablement rejection, the previous prior art rejections may be reinstated.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).




A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 6, 2004

  
**CAROL CHANEY**  
**PRIMARY EXAMINER**